WHAT IS CLAIMED IS:

1. A method for determining whether a test compound modulates the drug resistance of a cell, the method comprising:

   a) determining the level of expression or activity of a resistance sequence in a cell in the presence of a test compound;

   b) determining the level of expression or activity of the resistance sequence in the cell in the absence of the test compound; and

   c) identifying the compound as a modulator of drug resistance of the cell if the level of expression or activity of the resistance sequence in the cell in the presence of the test compound differs from the level of expression of the resistance sequence in the cell in the absence of the test compound.

2. The method of claim 1, wherein the resistance sequence is a nucleic acid encoding a protein selected from the group consisting of semaphorin D, B94, mel-14 antigen, 24p3, proliferin, and maspin.

3. The method of claim 1, wherein the resistance sequence is a polypeptide selected from the group consisting of semaphorin D, B94, mel-14 antigen, 24p3, proliferin, and maspin.

4. The method of claim 1 wherein the resistance sequence is encoded by an endogenous gene.

5. A method for determining whether a test cell has a drug-resistant phenotype, the method comprising:

   a) measuring the expression or activity of a resistance sequence in the test cell;

   b) comparing the expression or activity of the resistance sequence measured in step a) to the expression or activity of the resistance sequence in a control cell not having a drug-resistant phenotype; and

   c) determining that the test cell has a drug resistant phenotype if the expression or activity of the resistance sequence in the test cell differs compared to the expression or activity of the resistance sequence in the control cell.

6. The method of claim 5, wherein the resistance sequence is selected from the group consisting of semaphorin D, B94, mel-14 antigen, 24p3, proliferin, and maspin.

1   7.   A method for determining whether a subject has or is at risk of developing

2   a drug resistant tumor, the method comprising:

3   a) measuring the expression of an up-regulated or down-regulated resistance

4   mRNA in a biological sample comprising tumor cells obtained from the subject;

5   b) comparing the expression of the mRNA measured in step a) to the expression

6   of the mRNA in a control biological sample that is not drug resistant; and

7   c) determining that the patient has or is at risk of developing a drug resistant

8   tumor if the expression of an up-regulated mRNA in the biological sample obtained from the

9   patient is higher than the expression of the up-regulated mRNA in the control biological

10   sample, or decreased expression of a down-regulated mRNA in the biological sample

11   obtained from the patient is lower than the expression of the down-regulated mRNA in the

12   control biological sample.

1   8.   A method for treating a drug resistant tumor in a patient, the method

2   comprising administering to said subject an amount of an up-regulated protein antagonist or a

3   down-regulated protein agonist effective to reduce drug resistance of said tumor in the

4   patient.

1   9.   A method for determining whether a drug therapy should be continued in a

2   patient, the method comprising:

3   a. obtaining a biological sample comprising tumor cells from the patient;

4   b. determining the expression level of a resistance sequence in the patient sample;

5   c. comparing the expression level determined in step (b) with the expression of

6   the resistance sequence in a drug sensitive biological sample; and

7   d. discontinuing treatment when the expression level of the resistance sequence

8   in the patient sample is altered compared to the expression of the resistance sequence in the

9   drug sensitive sample.

1   10.   The method of claim 9, wherein the resistance sequence is an up-regulated

2   sequence and treatment is discontinued when expression of the sequence is increased

3   compared to the expression of the sequence in the drug sensitive sample.

1   11.   The method of claim 9, wherein the resistance sequence is a down-

2   regulated sequence and treatment is discontinued when expression of the sequence is

3   decreased compared to the expression of the sequence in the drug sensitive sample.

1　　　　12.　　A method for determining whether a drug therapy should be continued in a

2　patient, the method comprising

3　　　　　　a. obtaining a first patient biological sample comprising tumor cells and a second

4　biological sample comprising tumor cells, wherein the first sample is obtained prior to the

5　second sample;

6　　　　　　b. determining the expression level of a resistance sequence in the second

7　sample;

8　　　　　　c. determining the expression level of a resistance sequence in the first sample;

9　　　　　　c. comparing the expression level of the resistance sequence determined in step

10　(b) to the expression level of the resistance sequence in step (c); and

11　　　　　　d. discontinuing treatment when the expression level of the second sample differs

12　from the expression level of the resistance sequence in the first sample.

1　　　　13.　　The method of claim 12, wherein the resistance sequence is an up-

2　regulated sequence and treatment is discontinued when expression of the sequence in the

3　second sample is increased compared to the expression of the sequence in the first sample.

1　　　　14.　　The method of claim 12, wherein the resistance sequence is a down-

2　regulated sequence and treatment is discontinued when expression of the sequence in the

3　second sample is decreased compared to the expression of the sequence in the first sample.

1　　　　15.　　A method for treating a drug resistant tumor in a patient, the method

2　comprising administering to the patient a compound that reduces the expression of a protein

3　selected from the group consisting of: semaphorin D, B94, mel-14 antigen, 24p3, and

4　proliferin.

1　　　　16.　　A method for treating a drug resistant tumor in a patient, the method

2　comprising administering to the patient a compound that reduces the activity of a protein

3　selected from the group consisting of: semaphorin D, B94, mel-14 antigen, 24p3, and

4　proliferin.

1　　　　17.　　A method for treating a drug resistant tumor in a patient, the method

2　comprising administering to the patient a compound that increases the expression of maspin.

1   18.   A method for treating a drug resistant tumor in a patient, the method
2   comprising administering to the patient a compound that increases the activity of maspin.

1   19.   A method for determining whether a drug therapy should be continued in a
2   patient, the method comprising
3   a. obtaining a first patient biological sample comprising tumor cells and a second
4   biological sample comprising tumor cells, wherein the first sample is obtained prior to the
5   second sample;
6   b. determining the expression level of a gene selected from the group consisting
7   of: semaphorin D, B94, mel-14 antigen, 24p3, and proliferin in the second sample;
8   c. determining the expression level of the selected gene in the first sample;
9   c. comparing the expression level determined in step (b) to the expression level
10   determined in step (c); and
11   d. discontinuing treatment when the expression level determined in step (b) is
12   greater than the expression level determined in step (c).

1   20.   A method for determining whether a drug therapy should be continued in a
2   patient, the method comprising
3   a. obtaining a first patient biological sample comprising tumor cells and a second
4   biological sample comprising tumor cells, wherein the first sample is obtained prior to the
5   second sample;
6   b. determining the expression level of maspin in the second sample;
7   c. determining the expression level of maspin in the first sample;
8   c. comparing the expression level determined in step (b) to the expression level
9   determined in step (c); and
10   d. discontinuing treatment when the expression level determined in step (b) is
11   less than the expression level determined in step (c).

1   21.   The method of claim 19 or 20 wherein the expression level is determined
2   by measuring mRNA expression.

1   22.   The method of claim 19 or 20 wherein the expression level is determined
2   by measuring protein expression.